

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

NCS MULTISTAGE INC.
NCS MULTISTAGE, LLC.,

Plaintiff,

vs.

TCO AS,

Defendant.

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CIVIL ACTION NO. 6:20-cv-00622-ADA

**PLAINTIFFS NCS MULTISTAGE INC. AND
NCS MULTISTAGE, LLC'S OPENING CLAIM CONSTRUCTION BRIEF**

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This case involves the same patent NCS is asserting against Nine Energy Service, Inc. in a parallel lawsuit in this Court (“the Nine Litigation”). NCS asserts the same claims here as in the Nine Litigation.¹

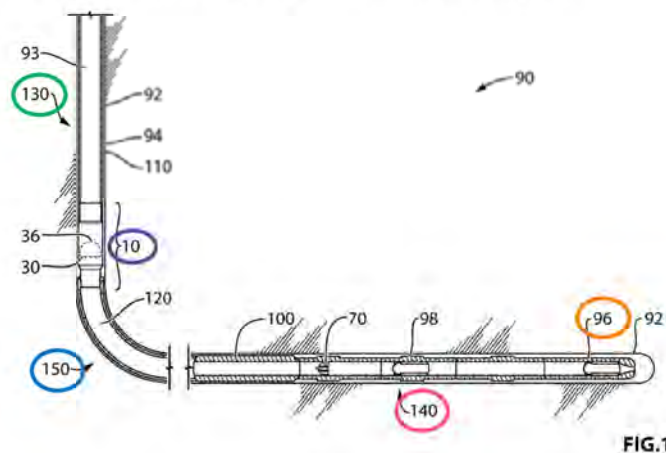
TCO proposes nine terms for construction. The Court construed four of those terms in the Nine litigation in Terms 4-7 of its January 21, 2021 *Markman* Order. Exhibit A at 2. TCO offers no new extrinsic evidence on those terms. Therefore, there is no reason for the Court to reconsider them. The prior constructions of those terms should apply here. The remaining terms proposed by TCO should be given their plain and ordinary meaning or found definite, as there is no actual dispute about their scope under *O2 Micro* and they are clearly understandable to a POSITA.

Finally, NCS respectfully requests the Court adopt its constructions in the Nine Litigation for Terms 1-3 and 8-9 of its January 21, 2021 *Markman* Order. *Id.* at 1-3. The parties do not dispute those constructions in this case.

I. THE '445 PATENT

U.S. Patent No. 10,465,445 (“the '445 Patent”) is directed to oil and gas tools. *See* Ex. B, Abstract, 1:16-17, 3:25-33. It teaches rupture disc assemblies and methods of using the assemblies to “float” a casing string into a well. *Id.*

Referring to Figure 1 of the '445 Patent, shown right, to make a well a borehole is first drilled into the Earth's



¹ *NCS Multistage Inc., et al. v. Nine Energy Service, Inc.*, Civil Action No. 6:20-CV-277-ADA.

crust. Ex. B, Fig. 1. Initially, the borehole is drilled vertically into the Earth (Fig. 1, portion 130 (green)). Ex. C at ¶ 16.² When the drilling reaches a target position (hydrocarbon layer), the drilling turns (the heel portion of the well 150 (blue)) and then progresses through the hydrocarbon layer in the lateral direction such that there is a horizontal portion 140 (pink) (i.e. the borehole is substantially parallel to the Earth's surface). *Id.* After the borehole is drilled to a target location, pipe called casing string is run into the borehole to maintain the integrity of the well walls. *Id.*, ¶ 17. As the casing string enters the heel 150 and turns horizontal, it will start to drag on the bottom of the well due to the weight of the pipe. *Id.*; Ex. B, 1:22-29, 5:52-58. As the casing string is pushed out along the horizontal portion 140, it may eventually reach a point where the drag on the casing becomes equal to the force pushing the casing forward such that it will become stuck. To overcome that problem, techniques were developed to “float” the casing string through the horizontal portion 140, which simply means making the casing string buoyant to reduce the drag and extend the reach of the casing string in the horizontal portion 140. Ex. B, 1:30-46; Ex. C at ¶¶ 16-18, 34.

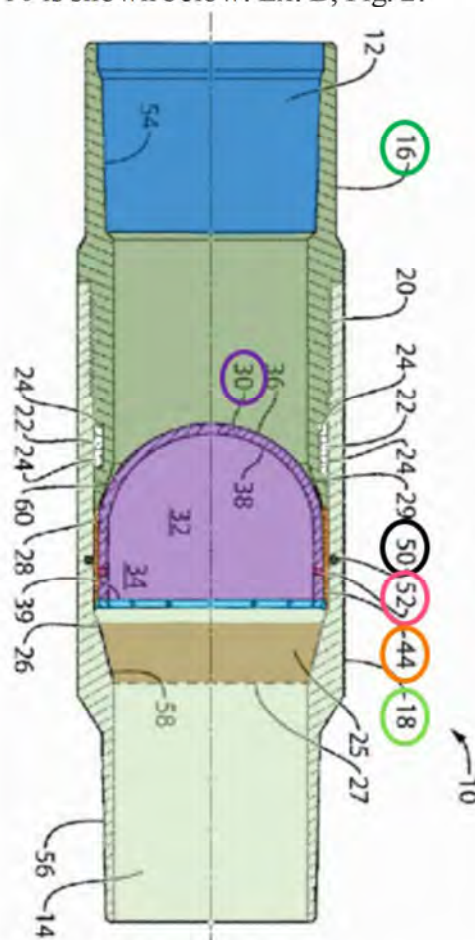
The '445 Patent covers inventive assemblies and methods to float casing string, inventions that now dominate the casing flotation market and are being used without authorization by numerous oil and gas companies, including Nine. In standard operation, an operator at the surface connects a lower seal, such as a float shoe 96 (orange), to the bottom portion of the casing string and runs or pushes the casing string to a certain depth in the vertical portion 130. Ex. B, 4:25-40, 5:62-66; Ex. C at ¶ 33. The operator then connects a rupture disc assembly 10 (purple) to the casing string, higher up the string from the lower seal. Ex. B, 4:11-

² NCS's Markman brief is supported by the Declaration of expert Dr. John Rodgers from the Nine Litigation, Dkt. 41-1 (“Rodgers Decl.”), which is filed concurrently herewith.

24, 6:5-8; Ex. C at ¶¶ 21, 26. The section of casing string between the rupture disc assembly and the lower seal forms a sealed chamber filled with air or gas (the “buoyant chamber”). Ex. B, 5:27-48; Ex. C at ¶ 21. The operator then fills the casing string above the rupture disc assembly with drilling mud, which builds the hydrostatic pressure inside the string to help push the buoyant chamber further into the wellbore. Ex. B, 6:5-8, 6:16-23; Ex. C at ¶ 26. Because the buoyant chamber is filled with air or gas, it is less dense than the surrounding borehole fluid and therefore tends to “float.” Ex. B, 1:22-39, 5:27-48, 13:20-26; Ex. C at ¶¶ 16-18, 34. Thus, when the buoyant chamber reaches the heel 150 there is less downward force against the bottom of the wellbore, reducing the drag and making it easier to run the casing through the horizontal portion 140 to the target position. *Id.*

An embodiment of the novel rupture disc assembly 10 is shown below. Ex. B, Fig. 2. The assembly includes a rupture disc 30 (purple) positioned within tubulars 16, 18 (green & lt. green). Ex. B, Fig. 2, 7:31-38; Ex. C at ¶ 21. A tubular is simply a pipe-shaped component that can be screwed into the casing string. Ex. B, Fig. 2, 6:67-7-3. The disc is sealed to a securing mechanism 44 (orange), which is sealed to the tubulars, via seals 52 (pink) and 50 (black). Ex. B, 8:44-50, 9:14-19; Ex. C at ¶¶ 21-22. The securing mechanism includes tabs upon which the disc rests (lt. blue). Ex. B, 9:67; Ex. C at ¶ 23.

Back to operation, after the casing string is “floated” to the target location, the operator then begins



a procedure to secure the string in place and allow fluid flow through to the end of the string. Ex. B, 6:24-49. To do so, the operator increases hydraulic pressure of the fluid in the string and at a certain pressure the force acting on the rupture disc 30 “overcome[s] the engagement function of the securing mechanism” (e.g. in the above embodiment, the securing mechanism’s tabs shear). Ex. B, 6:25-35, 9:67-10:6; Ex. C at ¶27. That releases the disc so that it accelerates in the downhole direction. Ex. B, 6:25-35, 9:67-10:6; Ex. C at ¶¶ 27, 35. The disc then impacts a surface that ruptures the disc. Ex. B, 6:32-35, 10:6-16, 41-47; Ex. C at ¶27. After rupture, the passage formed by the internal diameter of the string is now open to allow fluid to flow through unimpeded. Ex. B, 6:62-7:10, 10:47-53; Ex. C at ¶¶20, 28.

II. DISPUTED TERMS

A. “sealed chamber” (claims 8, 14, 22, 36, 40, 42, 46, and 50)

NCS’s Proposed Construction	TCO’s Proposed Construction
Plain and ordinary meaning	Substantially fluid-tight chamber where the rupture disc forms an upper seal of the chamber, a float device forms a lower seal of the chamber, and a casing string there between.

NCS contends this term does not need construction. TCO proposes a construction that adds numerous structural elements not in the plain language of the claim and clearly designed to improperly limit the scope of the term.

In the ’445 Patent a “sealed chamber” or “buoyant chamber” is created in a portion of the casing string so that the casing string can be floated through the horizontal section of a wellbore. *See, e.g.*, Ex. B at 4:19-28, 5:27-49; Ex. C at ¶ 16-18, 26, 39. That chamber contains a fluid, for example, air or other gas, that is lighter than the surrounding wellbore fluid. *See, e.g.* Ex. B at 5:34-37; Ex. C at ¶ 16. The chamber can be created by installing a seal device at the lower end of the casing string while it is being run downhole, and installing a seal device at a point above or upper to the lower seal, thus creating a “sealed chamber” in the casing string between the two

sealing devices. *See, e.g.*, Ex. B at 4:55-58; Ex. C at ¶¶ 16, 39. The upper and lower seals ensure that fluid in the wellbore does not enter the chamber as it is being run downhole. Ex. C at ¶ 39. The fluid in the chamber is less dense than the well fluid so that as the chamber is run into a wellbore it ‘floats.’ *See, e.g., id.* at 5:34-37, 5:47-79; Ex. C at ¶¶ 16, 39. There is no ambiguity in the term “sealed chamber,” as it has clear meaning in view of the intrinsic record. A POSITA can easily explain the term to the jury. Thus, the Court should give the term its plain and ordinary meaning. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc) (“Words of a claim are generally given their ordinary and customary meaning, which is the meaning a term would have to a person of ordinary skill in the art after reviewing the intrinsic record at the time of the invention.”)

TCO’s proposed construction attempts to narrow the term “sealed chamber” to specific components that can make up a “sealed chamber.” Nothing about the words “sealed chamber” specify the components that create that sealed chamber. Moreover, the dependent claims do specify components that can create a “sealed chamber.” For example, claim 8 recites that “the rupture disc forms an upper seal of a sealed chamber.” Ex. B at 14:52-53. Claim 14 recites a “lower seal on the sealed chamber,” claim 15 recites the lower seal is a “float shoe,” and claim 16 recites the “lower seal is within a float collar.” Ex. B at 14:66-15:4. In other words, TCO’s construction narrows “sealed chamber” to embodiments described in later dependent claims. TCO’s attempt to narrow the term to specific embodiments in the specification is improper. *Oatey v. IPS*, 514 F.3d 1271, 1276-77 (Fed. Cir. 2008) (“We normally do not interpret claims in a way that excludes embodiments disclosed in the specification...at least [sic] where claims can reasonably [sic] be interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence on the contrary.”). That is

especially true here where dependent claims include those embodiments. Under the doctrine of claim differentiation, the term in the independent claim “should not be read to be construed as requiring a limitation added by a dependent claim.” *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006).

There is no “actual dispute” between the parties as to the scope of this term because the term has clear meaning and TCO has manufactured a proposed construction solely to narrow the scope of this term to components that are not relevant to the term and found in dependent claims. Thus, the term does not need to be construed under *O2 Micro, O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360 (Fed. Cir. 2008) (“When the parties raise an actual dispute regarding the proper scope of these claims, the court, not the jury, must resolve that dispute.”). As such, the Court should give this term its plain and ordinary meaning.

If the Court believes the term “sealed” needs construction, NCS agrees with TCO that the “sealed chamber” is “substantially fluid-tight.”

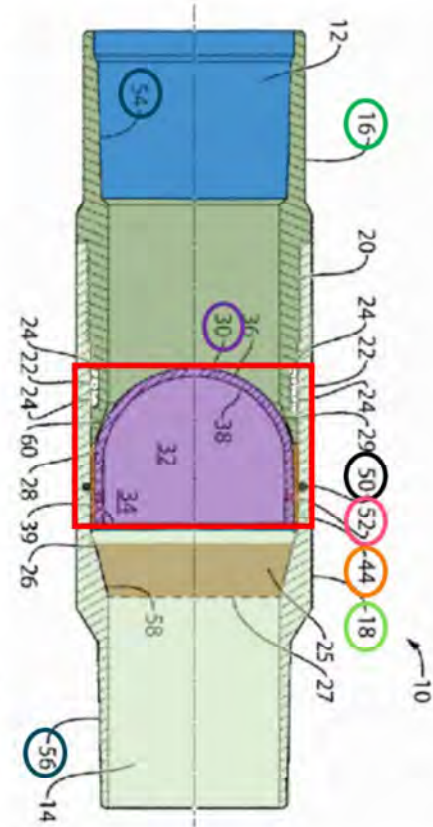
B. “within the upper and lower end” (claims 1, 8, 14-15, 22-25, 27-29, 36-43, 46, 50-53, and 55-57)

NCS’s Proposed Construction	TCO’s Proposed Construction
Plain and ordinary meaning	Inside of the upper and lower ends

NCS contends this term does not need construction. TCO proposes a construction that is confusing and, again, apparently intended to improperly narrow the scope of the claims.

The claims recite a rupture disc assembly that comprises “a tubular member having an upper and a lower end,” the rupture disc being “in sealing engagement with a region of the tubular member within the upper and lower ends.” This configuration is described in the specification. Referring to annotated Figure 2 below, the ’445 Patent teaches the rupture disc

assembly can be a tubular member made up of one tubular or multiple tubulars 16, 18 (green). Ex. B, 6:66-7:3, 7:17-21, 7:33-38; Ex. C at ¶ 21. The tubular member can have threaded ends 54, 56 (blue) to connect the assembly to the casing string. Ex. B, 7:59-64; Ex. C at ¶ 22. A rupture disc 30 (purple) is initially held in position in a region (red box) “within the upper and lower ends” 54 and 56 of the tubular member (blue). Ex. B, 6:66-7:3, 8:4-7; Ex. C ¶¶ 21-22, 24, 35. The term “within the upper and lower ends” has clear meaning, describing the rupture disc being positioned within (or between) the upper and lower ends of the tubular member. A POSITA can easily explain the term to the jury.



Thus, the Court should give the term its plain and ordinary meaning. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc)

TCO’s proposed construction, i.e. substituting the word “within” for “inside” is unnecessary, confusing, and arguably excludes embodiments. “Within” is a common word. It describes the location of the disc in the assembled rupture disc assembly, that is, somewhere within (or between) the upper and lower ends of the tubular member 56 and 54, as shown in the above image. There is no basis to “substitute” the common word “within” with another word. Furthermore, the word “inside” could suggest the term requires the rupture disc be positioned at the very bottom of the tubular, i.e. “inside” of the lower end 56, or positioned at the very top of the tubular member, i.e. “inside” of the upper end 54, or both. That would exclude the embodiment illustrated above, and others described in the specification. For example, in one

embodiment, which is illustrated above, when there are two coupled tubulars the rupture disc can be placed within the lower tubular, such as element 18 above (**light green**). Ex. B at Fig. 2, 8:4-31. In another embodiment, the disc can be positioned above the lower tubular. Ex. B at 2:54-55. In either embodiment, the disc is positioned within or between the upper and lower **ends** of the tubular member 54 and 56 (**blue**), but not “inside” of the ends of the tubular.

The Court should reject TCO’s confusing construction that seemingly excludes embodiments. *Oatey v. IPS*, 514 F.3d 1271, 1276-77 (Fed. Cir. 2008) (“We normally do not interpret claims in a way that excludes embodiments disclosed in the specification...at least [sic] where claims can reasonably [sic] be interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence on the contrary.”) As there is no “actual dispute” between the parties as to the scope of this term, the Court should give it plain and ordinary meaning under *O2 Micro*.

C. The Preamble is Not Limiting: “A float tool configured for use in positioning a casing string in a wellbore . . .” (claims 1 and 28)

NCS’s Proposed Construction	TCO’s Proposed Construction
No construction necessary, as the preamble is not limiting	The preamble is limiting because when read in the context of the entire claim, the preamble either recites limitations of the claim, or, is necessary to give life, meaning, and vitality to the claim limitations.

Generally, the preamble does not limit the claims. *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017). In some cases, a preamble limits the invention if it recites essential structure or steps, or if it is “necessary to give life, meaning, and vitality” to the claim. *Pitney Bowes, Inc. v. Hewlett-Packard*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). Conversely, a preamble is not limiting “where a patentee defines a structurally complete

invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.” *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997).

TCO alleges the preamble of claims 1 and 28 are limiting. The preambles recite:

A float tool configured for use in positioning a casing string in a wellbore containing a well fluid, the casing string having an internal diameter that defines a fluid passageway between an upper portion of the casing string and a lower portion of the casing string, the float tool comprising:

There is nothing in this preamble that qualifies as essential structure or steps necessary to understand the claims. Ex. B at 14:6-23, 16:1-20. In claims 1 and 28, the claim body recites the components of a rupture disc assembly. The preamble, which describes a “float tool” and “a casing string,” does not include any structures of a rupture disc assembly. The rupture disc assembly and all its components are fully described in the body of the claims. The preamble merely states “a purpose or intended use” for the rupture disc assembly, i.e. a float tool to position a casing string in a wellbore with fluid. *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997). Thus, the preamble is not necessary to understand the structure recited in the body of the claims, and the preamble is therefore not limiting under Federal Circuit law.

The asserted claims which depend from claims 1 and 28 also do not require the preamble be a limitation. Claims 8, 14, and 15, which depend from claim 1, and dependent claims 29, 36-43, and 46, which depend from dependent claim 28, either recite additional components of the rupture disc assembly, or components that can be used in a float tool, such as a rupture disc assembly, a sealed chamber, and a lower seal device. Again, nothing about the preambles in claim 1 or 28 recites structure **necessary** to understand these claimed structures.

Thus, TCO’s request to make the preamble limiting should be rejected.

D. Method Claims 22 and 50 are Not Indefinite as Mixed Method-Apparatus Claims

TCO alleges independent claims 22 and 50 (and their dependents) are invalid under 35 U.S.C. § 112 as reciting a combination of two statutory classes of inventions.³ That assertion is wrong because independent claims 22 and 50 are clearly method claims. Generally, they both recite:

“**A method** for installing casing in a wellbore containing a well fluid...:”

“**running** a casing string into the wellbore,

“the casing string having...upper and lower portions of the casing string separated by a chamber sealed on one end by a rupture disc assembly and on an opposing end by a seal...wherein the rupture disc assembly comprises....” and

“**floating** at least a portion of the casing string containing the sealed chamber in the well fluid...”

In sum, the claims recite a method of running and floating casing that has a sealed chamber created by a rupture disc assembly and a lower seal.

There is nothing improper about a method claim that recites structures used in the performance of the method steps. That is a common way to write method claims. The description of the structure used to perform the method gives meaning to the method.

Whether the claim is indefinite as being a mixed method and apparatus claim turns on whether “it is unclear whether infringement...occurs when one creates a system that allows the

³ As TCO has not proposed any single claim term for construction, NCS contends this is not a claim construction issue, and that it should be raised by TCO post-*Markman*. Moreover, TCO has the burden of moving on that issue. Nevertheless, the parties have agreed to brief the issue.

user to [practice the claimed method step], or whether infringement occurs when the user actually practices the method step.” *Microprocessor Enhancement Corp. v. Tex. Instruments Inc.*, 520 F.3d 1367, 1374-75 (Fed. Cir. 2008) (quoting *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1383-84 (Fed. Cir. 2005)). Here, there is no lack of clarity in these independent claims about when infringement happens. It happens when an accused infringer runs casing string in a well that has a sealed chamber created by a rupture disc assembly combined with a lower seal and floats that chamber in the wellbore fluid. One cannot infringe this claim simply by making a sealed chamber with a rupture disc assembly and a lower seal, because that does not involve “running” and “floating” the casing. Thus, these claims are clearly not indefinite as mixed method and apparatus claims and the Court should thus reject TCO’s indefiniteness allegation.

E. “rupture burst pressure”

NCS’s Proposed Construction	TCO’s Proposed Construction
No construction.	a hydraulic pressure sufficient to break the rupture disc (i.e. the pressure at which the disc would break in response to hydraulic pressure alone)

In the Nine Litigation, the Court considered this term in the larger term “the rupture disc is...configured to rupture when exposed to a rupturing force greater than the rupture burst pressure.” Ex. A at 2. The Court construed that larger term as “the rupture disc can rupture when exposed to a rupturing hydraulic pressure greater than the rupture burst pressure.” *Id.* As such, the Court recognized that “rupture burst pressure” did not need construction. NCS agrees. That term has clear meaning to a POSITA in light of the specification, where the “rupture burst pressure” is defined as the pressure at which the rupture disc would rupture due to a hydraulic pressure **alone**.

Moreover, as shown above in TCO's construction, it appears TCO agrees that the term has plain meaning, as its proposed construction is virtually identical to the above definition. Indeed, NCS had hoped the parties could agree on a construction so that the Court is not burdened considering this term. NCS proposed the following minor modifications to TCO's proposed construction:

a hydraulic pressure sufficient to ~~break~~ rupture the rupture disc (i.e. ~~the~~ a pressure at which the disc would ~~break~~ rupture in response to hydraulic pressure alone)

For consistency purposes, NCS proposed the term "break" in TCO's proposed construction be changed to "rupture," as the word "break" is not used in any of the claims, while the word "rupture" is used in both the claims and the Court's constructions issued in the Nine Litigation. *Id.* There is no reason to substitute the common word "rupture" with the new word "break." Similarly, NCS also proposed the term "the" in the parenthetical be modified to "a" so that it is consistent with the term "a hydraulic pressure" in TCO's proposed construction. Inexplicably, TCO rejected these minor fixes, requiring the parties brief this term.

In any case, there is no dispute about the scope of this term, and thus under *O2 Micro* this term should be given its plain and ordinary meaning. *O2 Micro*, 521 at 1360 (Fed. Cir. 2008) ("When the parties raise an actual dispute regarding the proper scope of these claims, the court, not the jury, must resolve that dispute."). If the Court is inclined to construe the term, NCS suggests it adopt TCO's proposed construction with NCS's proposed minor revisions.

F. Terms Previously Construed by the Court

TCO proposes the Court revisit four constructions in the Nine Litigation as shown in the table attached as Exhibit D. TCO is not offering any new extrinsic evidence to support its

arguments on these terms.⁴ In the Nine Litigation, the parties submitted six briefs, exhaustively arguing claim constructions for these terms considering the intrinsic evidence and extrinsic evidence and presented oral arguments to the Court. There is no reason why the Court should revisit these terms on the evidence it has already thoroughly considered. Nevertheless, TCO rejects the Court’s constructions and either proposes an alternative construction or re-raises the indefiniteness arguments made in the Nine Litigation. So as not to overburden the Court with briefing it has already considered, NCS has attached hereto as Exhibit E its Opening *Markman* brief and accompanying exhibits in the Nine Litigation and will reference that briefing below where relevant. NCS will also address TCO’s proposed constructions or indefiniteness arguments where necessary.

- i. **“region of the tubular member where the rupture disc is attached . . . is parallel to the internal diameter of the casing string” (claims 1, 22, 28, and 50)**

Court’s Construction	TCO’s Construction
Plain and ordinary meaning where the plain and ordinary meaning is “in the region of the tubular member, the rupture disc is directly secured to and in sealing engagement with a cylindrical surface that is wider than and parallel to the inner surface of the casing string”	Indefinite

TCO argues this term is indefinite, “because it requires that two features which have no inherent direction must be parallel.” This same argument was made by Nine in the Nine Litigation and was exhaustively brief by the parties, and the Court rejected it. If the Court wishes to revisit NCS’s *Markman* arguments from the Nine Litigation that supported the Court’s

⁴ TCO’s disclosure of extrinsic evidence states its expert Dr. Neal Adams will opine that the term “specific gravity” is indefinite because specific gravity changes as a function of well depth. The Court considered this same argument by Nine’s expert in the Nine litigation and rejected it.

decision, they can be found in the attached Exhibit E, § F. NCS respectfully reserves the right to rebut any arguments made by TCO in its responsive brief.

ii. “a rupturing force” (claims 14-15, 22-25, 27, 29, and 56)

Court’s Construction	TCO’s Construction
“a hydraulic pressure or impact force sufficient to rupture the rupture disc”	<p>a hydraulic pressure sufficient to disengage the securing mechanism (i.e., a disengaging pressure)</p> <p>Invalid for lacking utility under 35 U.S.C. § 101</p> <p>Lacking Enablement under 35 U.S.C. § 112</p>

As shown above, this term proposed by TCO was already construed by the Court in the Nine Litigation. NCS agrees with the Court’s construction. If the Court wishes to revisit NCS’s *Markman* arguments from the Nine Litigation that supported the Court’s decision, they can be found in the attached Exhibit E, § D. NCS reserves the right to rebut any arguments made by TCO in its responsive brief.

TCO proposes the Court reject its prior construction and limit the term “rupturing force” to “a hydraulic pressure sufficient to disengage the securing mechanism (i.e., a disengaging pressure).” This construction is improper and nonsensical for the following reasons.

First, TCO’s construction inexplicably adds the term “securing mechanism,” which is not a structure recited in any of the claims. This is clearly improper.

Second, TCO’s construction excludes **both** types of forces that actually rupture the disc—i.e. a hydraulic pressure or impact force.

Specifically, the disc can rupture when exposed to a hydraulic pressure **alone** if the hydraulic pressure is above the disc’s rupture burst pressure. Ex. B, 3:1-3, 4:60-64, 11:8-22; Ex. C at ¶ 48. For example, if the disc has a rupture burst pressure at 10,000 psi, it will rupture when

its surface is exposed to a hydraulic pressure greater than that amount. This concept is found in claims 1, 22, 29, and 56, which recite that the “the rupture disc is...configured to rupture when exposed to a rupturing force greater than the rupture burst pressure.” Because these claims reference the disc’s rupture burst pressure, they are **only** referring to a hydraulic force that can rupture the disc. This claim term is not directed to hydraulic pressure that disengages the disc. TCO’s construction improperly excludes this rupturing force by limiting the term to a “disengaging pressure.”

Further, in one embodiment, when the disc is installed in a rupture disc assembly, it is designed to rupture due to a combination of a hydraulic pressure and an impact force. For example, the disc can be exposed to a pressure sufficient to disengage the disc, which is lower than the rupture burst pressure of the disc (e.g., a disengaging pressure of 3,000 psi, versus a rupture burst pressure of 10,000 psi). When it disengages, the disc is released from its position and accelerates in the downhole direction. The disc ruptures from the combination of a hydraulic force that causes the disc to accelerate in the downhole direction, which may or may not be the “disengaging pressure” that released the disc, and an impact force when the disc hits a surface. Ex. B, 2:3-30, 10:35-47, 11:27-12:22; Ex. C at ¶¶28-29, 49. This concept is found in claim 56, which following disengagement of the disc in claim 55, recites “applying a rupturing force to rupture the disc.” Ex. B at 18:33-39. This “rupturing force” refers to the combination of a hydraulic pressure causing the disc to accelerate and an impact force. TCO’s construction makes no sense, because the “disengaging pressure” is not alone a force that ruptures the disc, and not necessarily the one that ruptures the disc.

For the foregoing reasons, the Court should reject TCO’s proposed construction and maintain its construction in the Nine Litigation.

Finally, TCO alleges that its interpretation results in a claim that is invalid under § 101 for lacking utility or § 112 for lacking enablement. If that is true, that is another reason to reject TCO's construction. As explained above, TCO's interpretation is wrong and thus its invalidity arguments are meritless. Furthermore, TCO's utility and enablement arguments should not be considered at this time as being premature, because at this stage the Court's order only permits the parties to propose claim constructions and raise indefiniteness. Dkt 45 at 2.

iii. “the rupture disc is...configured to rupture when exposed to a rupturing force greater than the rupture burst pressure” (claims 1, 22, 29, and 56)

Court's Constructions	TCO's Construction
the rupture disc can rupture when exposed to a rupturing hydraulic pressure greater than the rupture burst pressure	the rupture disc can rupture when exposed to a rupturing hydraulic pressure <u>equal to</u> or greater than the rupture burst pressure

As shown above, this term proposed by TCO was already construed by the Court in the Nine Litigation. NCS agrees with the Court's construction. If the Court wishes to revisit NCS's *Markman* arguments from the Nine Litigation that supported the Court's decision, they can be found in the attached Exhibit E, § E. NCS respectfully reserves the right to rebut any arguments made by TCO in its responsive brief.

TCO's proposal is to add the term “equal to” to the Court's construction. But there is no basis for that. The claim term recites “a rupturing hydraulic pressure *greater than* the rupture burst pressure.” It does not say anything about “equal to”. Further, nowhere in the specification does it describe the rupturing force being “equal to” the rupture burst pressure. This is a superfluous addition to the Court's construction, unsupported by the specification and the claim itself. Thus, the Court should reject it.

iv. “specific gravity of the well fluid” (claims 24 and 52)

Court’s Construction	TCO’s Construction
Plain and ordinary meaning	Indefinite

TCO argues this term is indefinite. This same argument was made by Nine in the Nine Litigation, exhaustively briefed by the parties and argued at the claim construction hearing, and the Court rejected it. If the Court wishes to revisit NCS’s *Markman* arguments from the Nine Litigation that supported the Court’s decision, they can be found in the attached Exhibit E, § G. NCS respectfully reserves the right to rebut any arguments made by TCO in its responsive brief.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned certifies that all counsel of record were electronically served with a copy of the foregoing on April 2, 2021 via the Court's CM/ECF system.

/s/ Munira Jesani
Munira Jesani